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MAY 2, 1932

NAVY DEPARTMENT SPECIFICATION

CEMENT, RUBBER (AIRCRAFT USE)

A. GENERAL SPECIFICATIONS.

General Specifications for Inspection of Material, issued by the Navy Department, and Federal Specification ZZ–R–601, Rubber Goods: General Specifications (Methods of physical tests and chemical analyses), in effect at date of invitation for bids, shall form part of this specification.

B. TYPES.

Rubber cement shall be of the following types, as specified:

Type A.—Self-curing.
Type B.—Air-drying.

C. MATERIAL AND WORKMANSHIP.

C–1. *Rubber.*—The cement shall be prepared from compounded rubber. The rubber of the compound shall be of the best quality, washed and air-dried, plantation or up-river, fine hard Para rubber. Suitable compounding materials shall be added to the rubber in amounts just sufficient to insure that the resulting cement shall have the requisite tackiness, strength, adhesion, aging, and working qualities for satisfactory use.

C–2. *Solvent.*—

C–2a. The solvent to be used in the preparation of the cement shall be benzol or solvent gasoline.

C–2b. The benzol shall be high grade, clear, colorless, and water-free. It shall have a minimum boiling point of 75° C. and a maximum dry point of 82° C.

C–2c. The solvent gasoline shall be clear, colorless, and water-free. It shall have a minimum boiling point of 40° C. and a maximum dry point of 145° C. Ninety eight per cent of the solvent shall be recovered.

C–2d. The use of other high-grade solvents will be permitted, provided they are equally suitable for the purpose, are no more toxic than benzol or gasoline, and are not injurious to cloth.

C–3. *Preparation.*—The rubber compound shall be milled and cut in the solvent in accordance with the best commercial practice. Care shall be taken to break down the rubber only to the point where the compound shall be well mixed with the rubber, and where the requisite amount of tackiness shall be obtained. The selection of hard rubber and care to prevent overmilling are emphasized.

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D. GENERAL REQUIREMENTS.

See section E.

E. DETAIL REQUIREMENTS.

E–1. *Fineness.*—All cement shall be strained through a sieve having not less than 80 meshes to the inch.

E–2. *Aging.*—

E–2a. Cement shall not become stringy, and the compound shall not settle if the cement is allowed to stand in a covered receptacle for three months previous to use.

E–2b. Type A, self-curing cement, while stored in the unmixed state, shall not become cured.

E–3. *Seam strength.*—

E–3a. *Self-curing type.*—Seams prepared in accordance with paragraph F–2 shall sustain, without separating, a dead load of 40 pounds per inch width of seam for 24 hours at a temperature of 135° F. plus or minus 3° F.

E–3b. *Air-drying type.*—Seams prepared in accordance with paragraph F–2 shall sustain, without separating, a dead load of 30 pounds per inch width of seam for 24 hours at a temperature of 118° F. plus or minus 2° F.

E–4. When exposed to reasonable temperature and conditions of use, seams shall remain flexible and shall not harden, soften, or separate.

F. METHOD OF INSPECTION, TESTS, ETC.

F–1. Cement furnished under this specification shall conform to the requirements of this specification whenever tested during a 3-month period subsequent to receipt at destination.

F–2. *Test seams.*—

F–2a. Seam tests, paragraph E–3, shall be made on a ¾-inch lap of rubberized balloon fabric, constructed of two plies, laid on the straight, of Type MM finished airship cloth, conforming to the requirements of Navy Department Specification 27C13, of the issue in effect at date of invitation for bids. The balloon fabric shall have a tensile strength of not less than 160 pounds per inch width, when tested on an inclination balance type testing machine.

F–2b. The seams shall be so constructed that the threads parallel to the edges shall be the straight filling threads of the fabric. The aluminum coating shall be buffed off for a distance of ¼ to ½ inch beyond the lap. The buffed surfaces shall be washed thoroughly with benzol or rubber-solvent gasoline, as specified by paragraph C–2, to remove sulphur bloom and soapstone.

F–2c. Cementing in the open shall be avoided, as also shall be cementing on wet days and in sunlight.

F–2d. All cement shall be thoroughly mixed before using. Care shall be taken to prevent unnecessary evaporation.

F–2e. Coatings of the cement shall be applied to the surfaces in the consistency and with the proper time interval between coats as shall be advisable under the existing atmospheric conditions. The coats shall be brushed well into the fabric. After the last coat has been

applied and the proper degree of tackiness reached, the pieces shall be laid together and well rolled out to exclude all air bubbles.

F–2f. The seam shall not be subjected to any cure other than that which may occur as part of the natural aging of the cement. Before testing, seams shall be allowed to dry at least 10 days.

F–3. *Seam strength.*—Seams prepared in accordance with paragraph F–2 shall be cut into 2-inch wide strips of sufficient length for testing in accordance with paragraph E–4. The 2-inch wide strips shall be tested so that the entire strip or the portion thereof containing the seam shall be continuously exposed to the temperatures specified. The seams shall meet the strength requirements of paragraph E–3 for the type cement specified.

F–4. The inspector shall stamp all containers of accepted cement with the official acceptance stamp. The existence of the official acceptance stamp on the container shall not bar rejection during the 3-month period as specified in paragraph F–1.

G. PACKING AND MARKING.

G–1. *Packing.*—

G–1a. The cement shall be shipped in 1-quart or 1-gallon containers, as specified in the order. Air-drying cement, Type B, may be ordered in drums for special purposes.

G–1b. Containers shall be packed in substantial wooden boxes, so constructed as to insure acceptance by common or other carriers for safe transportation at the lowest rate to the point of delivery. The packing shall comply with Interstate Commerce Commission "Regulations for Transportation by Rail of Explosives and Other Dangerous Articles in Freight, Express, and Baggage Services."

G–2. *Marking.*—

G–2a. Containers and drums shall be marked with the name of the material, the type, the quantity contained therein, the date of manufacture, the number of the contract or order, and the manufacturer's name or trade-mark.

G–2b. Shipping containers shall be marked with the name of the material, the type, and the quantity contained therein as defined by the contract or order under which shipment is made, the name of the contractor, and the number of the contract or order. Shipping containers shall also be marked in conformity with Interstate Commerce Commission "Regulations for Transportation by Rail of Explosives and Other Dangerous Articles in Freight, Express, and Baggage Services."

H. NOTES.

H–1. The cement is intended for use in cementing seams, patches, and fabric accessories used in airship and balloon construction, and in flotation bags and inflatable life rafts.

H–2. Type A, self-curing cement, is intended primarily for factory use; Type B, air-drying cement, is intended primarily for field use.

H–3. Instructions shall be pasted on all cement containers covering the recommended use of the cement and precautions necessary for proper storage. In the case of self-curing cement, the instructions

shall cover completely and thoroughly the method of mixing, period of time after mixing during which cement may be used, etc.

H–4. Copies of Navy Department specifications and any other specifications forming a part thereof may be obtained upon application to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. When requesting, refer to specification by both title and number (or symbol).

REFERENCES:

Aer. Aer-D-158-EC, JJ52C3(NDS), JJ52C3, Feb. 2 and Mar. 31, 1932.
Navy Department Specifications Board 1st end., Feb. 3, 1932.
Eng. L2-1 (2-2-Ds), Feb. 16, 1932.
Ord. L2-1(3265) (Dm8-5), Feb. 19, 1932.
Y. & D. L2-1, Feb. 23, 1932.
S. & A. L2/JJ-52C9.

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